



Wokingham Major Highways Programme - South Wokingham Distributor Road (SWDR) - Western Gateway Phase 2 (WG2)

Ecological Assessment of Lighting Scheme WMHP-TG-WG2-RP-LS-3002

(Revision P02, Date 16/07/2024)

Wokingham Major Highways Programme - South Wokingham Distributor Road (SWDR) - Western Gateway Phase 2 (WG2)

Ecological Assessment of Lighting Scheme

Wokingham Borough Council

Document no: WMHP-TG-WG2-RP-LS-3002

Revision: P02

Date: 16/07/2024



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Report Title:	Ecological Assessment of Lighting Scheme
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Rev	Date	Description and Purpose of Issue	Prepared	Reviewed	Approved
P01	18/08/21	First Issue	DH	JM	JM
P02	16/07/24	Updated Appendices for Planning Condition Discharge	JB	DJF	JC

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Ben Hawkins
Tony Gee and Partners Ltd

17th August 2021

Our Reference: 3493/Bats Lighting/V1.0
Your Reference: WG2 – LEMP and Ecological Assessment of Lighting Scheme

Dear Ben,

Introduction

Arcus Consultancy Services Ltd was commissioned by Tony Gee & Partners LLP to produce an appraisal of a lighting scheme for land west of Finchampstead Road and south of Molly Millar's Lane, Wokingham, RG41 2PE, (approximate National Grid Reference SU 80771 67755) (henceforth referred to as the 'Site').

This report has been prepared to enable the progression of enhancement works to the A321 Finchampstead Road/Molly Millar's Lane roundabout (the 'Development'), as part of the wider South Wokingham Distributor Road scheme. The roundabout enhancement scheme will comprise realignment of the existing highway along Finchampstead Road and Molly Millar's Lane including the following works:

- Demolition of properties 81 and 83/85 Finchampstead Road;
- Replacement of the existing three-arm mini roundabout with a larger roundabout; and
- Associated landscaping and changes to the pedestrian crossing environment.

Background

Previous assessments have recorded bat activity from common pipistrelle commuting and foraging within garden habitats of the Site.

Following these assessments, ecological enhancement measures for bats were proposed¹, which also included report recommendations with regard to bats and lighting that stated the following:

'The Survey Site already experiences moderate levels of lighting from residential properties and street lighting, and any bats currently foraging in the area will therefore be accustomed to this level of disturbance. However, to ensure lighting does not impact bats during the construction and operational stages of the Development, retained and adjacent, garden and boundary habitat that could be used by foraging bats is unlit by additional lighting.'

A lighting plan was subsequently completed that sought to address these recommendations and to try and ensure that impacts to bats from lighting would be minimised.

This statement therefore seeks through review of documents to determine whether the lighting scheme sufficiently ensures that bats are protected within the Development, and that it is pursuant to the discharge of Condition 5 of the Development's planning permission (Application No. 203535). In doing so, reference should be made to the following:

- Bat Activity Survey Report¹;
- Roundabout Enhancement Lighting Plan²; and
- Lighting Design Calculations³.

For expediency, the lighting outputs are appended to end of this letter (see Appendix A).

Planning Conditions

The planning decision notice for the Development includes a condition relating to bats and lighting. The provisions of Condition 5 of the planning decision notice (203535) dated 24th May 2021 stated the following:

'Lighting

5. Prior to commencement of the development, a Lighting Scheme shall be submitted to and approved in writing by the local planning authority. The scheme shall:

i) identify those areas/features on site that are particularly sensitive for bats and that are likely to cause disturbance in or around their resting places or along important routes used to access key area of their territory, for example foraging; and

ii) Specify the type of lighting to be used and how and where it will be installed in order to provide for the safe operation of the highway;

iii) demonstrate that areas to be lit will not disturb or prevent the above species using their territory or having access to their breeding sites and resting places.'

Legislation

Currently there are 17 species of bat known to breed in the UK. All species and their roosts are protected under Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. As a signatory to the Bonn Convention (Agreement on the Conservation of Bats in Europe) the UK is also required to protect their habitats. This legislation makes it illegal to kill, injure, capture or disturb bats or to obstruct access to, damage or destroy bat roosts and protection from damage or disturbance of important feeding areas. Under the law, a roost is any structure or place used for shelter or protection.

Bats and Lighting

The Roundabout Enhancement Lighting Plan in combination with the Lighting Design Calculations indicate that external lighting will be focussed towards areas that are required for safety and security within the Development, such that the lighting complies with the core strategy⁴ criteria, and notably CP3 and CP7, to ensure that there are no detrimental impacts on important ecological features and that bats maintain their favourable conservation status on site.

It is understood from the lighting engineer that shields will be added to luminaires LC02B, LC03B, and LC05B, which are located within areas of hardstanding and will further reduce the Lux levels within garden and soft landscaped habitat that may be used by foraging or commuting bats. Furthermore, external lighting will be dimmed from category C3 (*circa* 15 Lux maximum) to C4 (*c.*10 Lux maximum) during night time hours. This will ensure that bat species flying high over the Development will be less impacted by light spill over the road infrastructure, and all commuting

¹ Tony Gee (2020) *Bat Activity Survey Report*, Wokingham Brough Council (Document no: WMHP-TG-WG2-RP-EV-0007)

² Tony Gee (2021) *Roundabout Enhancement Lighting Plan*: WMHP-TG-WG2-DR-LI-1301 (Plan Dated February 2021)

³ Tony Gee (2021) *Lighting Design Calculations*: WMHP-TG-WG2-CA-LI-1301 (Revision P01, Date 30/07/2021)

⁴ *Wokingham Borough Local Development Framework: Adopted Core Strategy Development Plan Document*. January 2010

and foraging bats will experience long periods of lower light levels throughout night time hours when they are active.

External lighting is predominantly proposed for installation within what is currently an urban environment, mostly comprised of road and hard landscape infrastructure, which is habitat offering a very low value for foraging bats and no strong commuting habitat features. Existing lighting will be retained in places (south of roundabout), and replaced with new lighting that will be positioned within the existing road infrastructure, but will become part of the newly constructed roadside infrastructure. On this basis, existing habitats of negligible value to bats will continue to be lit for safety and security purposes, but habitats with value to foraging and commuting bats will not be subjected to further impacts, and with mitigation from installed lighting shields and timed dimming is on balance likely to reduce lighting levels within these more valuable habitats.

As no roosts are present within the Site and bat boxes will not be directly lit, it is also considered unlikely that the lighting plan will impact roosting bats in any way; however, the lighting prescription, and lighting mitigation employed will ensure that impacts to roosting bats will also be sufficiently mitigated.

Conclusion

With the information provided and lighting plan proposed, the impact to roosting, commuting and foraging bats is sufficiently mitigated, whilst the information provided is considered sufficient to enable Wokingham Borough Council to be able to discharge Condition 5 of the planning application.

I trust the above is clear and provides you with the information that you need. Please do not hesitate to contact me if you need more advice.

Yours sincerely,



Daniel Hardie MSc MCIEEM
Senior Ecologist

Appendix A: - Lighting Outputs



Wokingham Major Highways Programme - South Wokingham Distributor Road (SWDR) - Western Gateway Phase 2 (WG2)

**Lighting Design Calculations
WMHP-TG-WG2-CA-LI-1301**

(Revision P02, Date 16/07/2024)



Balfour Beatty

Wokingham Major Highways Programme - South Wokingham Distributor Road (SWDR) - Western Gateway Phase 2 (WG2)

Lighting Design Calculations

Wokingham Borough Council

Document no: WMHP-TG-WG2-CA-LI-1301

Revision: P02

Date: 16/07/2024



Document Issue Record

Project:	Wokingham Major Highways Programme - South Wokingham Distributor Road (SWDR) - Western Gateway Phase 2 (WG2)
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P01	30/07/21	First Issue	DJF	BH	JC
P02	16/07/24	Updated Appendices for Planning Condition Discharge	JB	DJF	JC

Issuing Office:	Tony Gee and Partners LLP, Hardy House, 140 High Street Esher, Surrey, KT10 9QJ
Tel:	+44 1372 461600
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DATE: 16 July 2024
DESIGNER: Jennifer Barclay
PROJECT No: WMHP-TG-WG2-CA-LI-1301
PROJECT NAME: WMHP - SWDR WG2 - Lighting Calculations

**LIGHTING
REALITY**

Outdoor Lighting Report

PREPARED BY: Design Software from:
Lighting Reality Ltd
Avon House
Buntsford Drive
Stoke Heath
Bromsgrove B60 4JE
e-mail: sales@lightingreality.co.uk
website: www.lightingreality.co.uk

Layout Report

General Data

Dimensions in Metres Angles in Degrees

Calculation Grids

ID	Grid Name	X	Y	X' Length	Y' Length	X' Spacing	Y' Spacing
1	Grid 1	480687.14	167821.94	90.33	58.07	1.48	1.49
2	Grid 2	480763.66	167754.34	68.63	54.98	1.46	1.49
3	Grid 3	480786.33	167716.49	42.16	41.85	1.45	1.49

Luminaires



Luminaire A Data

Supplier	Philips
Type	BGP623_DM10_13000_80LED_5.1S_CLO_L90_NW
Lamp(s)	LED-HB 5.1S NW
Lamp Flux (klm)	13.00
File Name	Luma 1_BGP623_DM10_13000_80LED_5.1S_CLO_L90_NW.ies
Maintenance Factor	0.74
Imax70,80,90(cd/klm)	523.4, 90.0, 0.0
No. in Project	2



Luminaire B Data

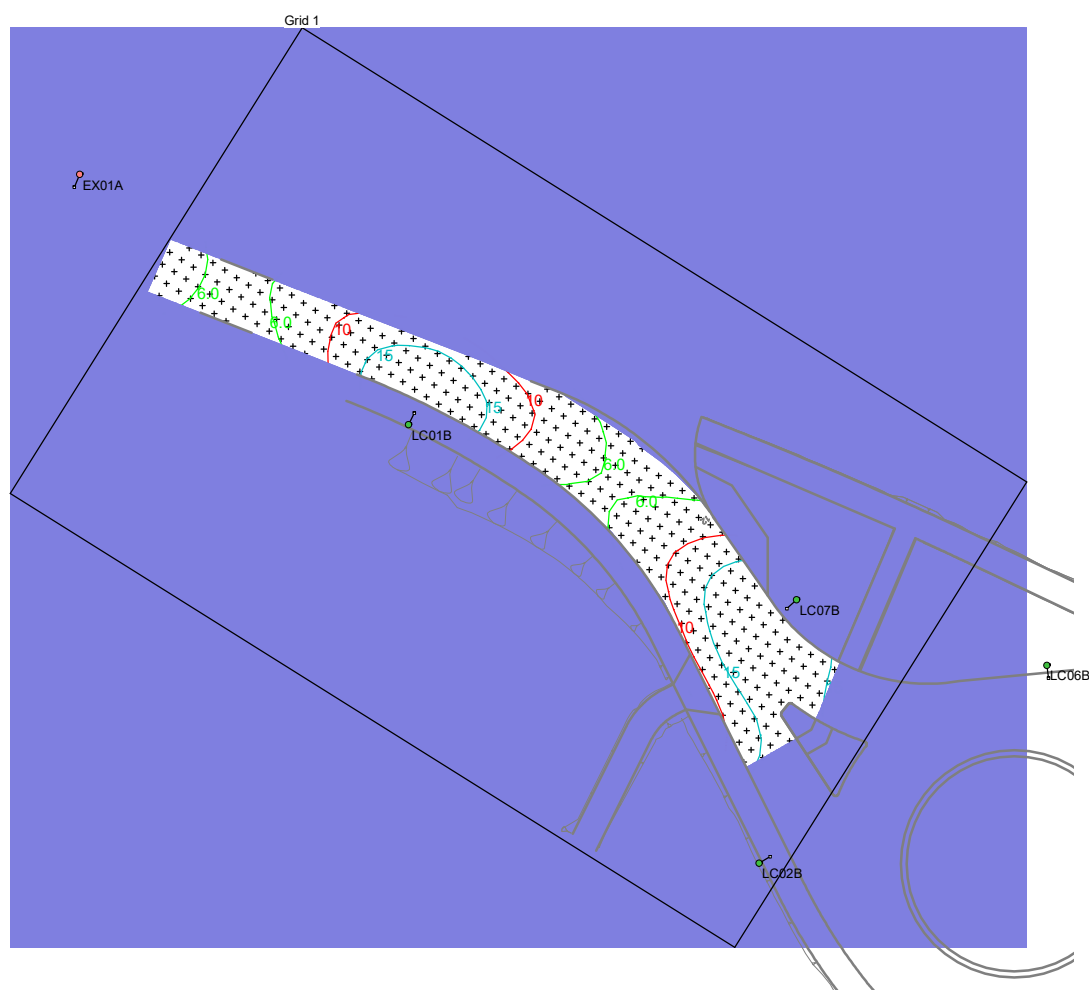
Supplier	Philips
Type	BGP621_DM11_12000_40LED_5.1S_CLO_L90_NW
Lamp(s)	LED-HB 5.1S NW
Lamp Flux (klm)	12.00
File Name	Luma Mini_BGP621_DM11_12000_40LED_5.1S_CLO_L90_NW.ies
Maintenance Factor	0.83
Imax70,80,90(cd/klm)	562.5, 97.5, 0.0
No. in Project	7

Layout

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
LC06	B	480796.66	167803.76	10.00	277.00	0.00	0.00	1.36			
EX01	A	480694.49	167855.65	10.00	247.00	0.00	0.00	1.50			
LC05	B	480826.28	167792.69	10.00	117.00	0.00	0.00	1.36			
LC03	B	480783.80	167761.27	10.00	65.00	0.00	0.00	1.36			
LC04	B	480812.87	167773.30	10.00	167.00	0.00	0.00	1.36			
EX02	A	480796.17	167727.50	10.00	152.00	0.00	0.00	1.50			
LC02	B	480766.24	167782.85	10.00	30.00	0.00	0.00	1.36			
LC01	B	480729.22	167829.18	10.00	64.00	0.00	0.00	1.36			
LC07	B	480770.19	167810.69	10.00	223.00	0.00	0.00	1.36			

Horizontal Illuminance (lux)

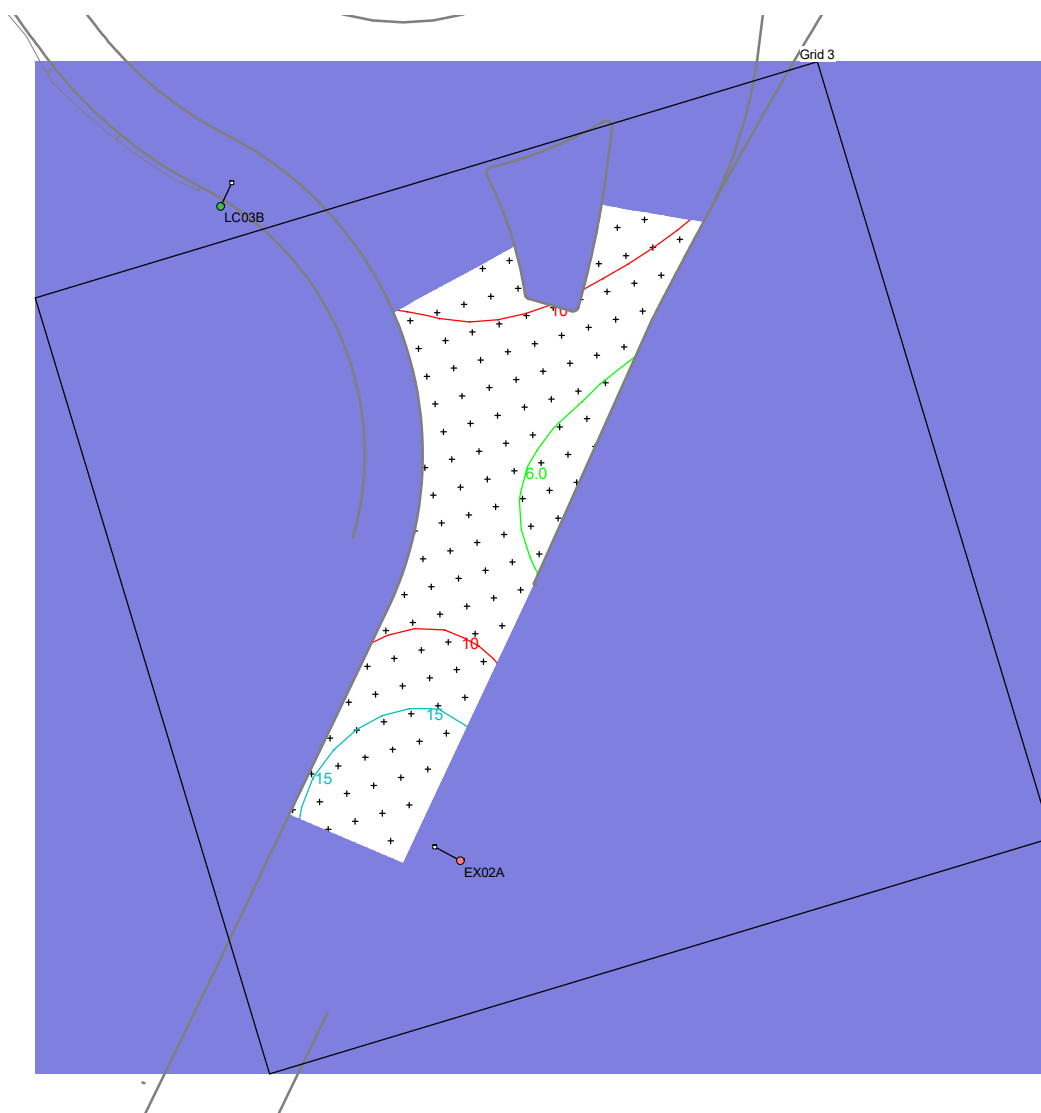
Grid 1

**Results**

Eav	11.78
Emin	4.90
Emax	26.72
Emin/Emax	0.18
Emin/Eav	0.42

Horizontal Illuminance (lux)

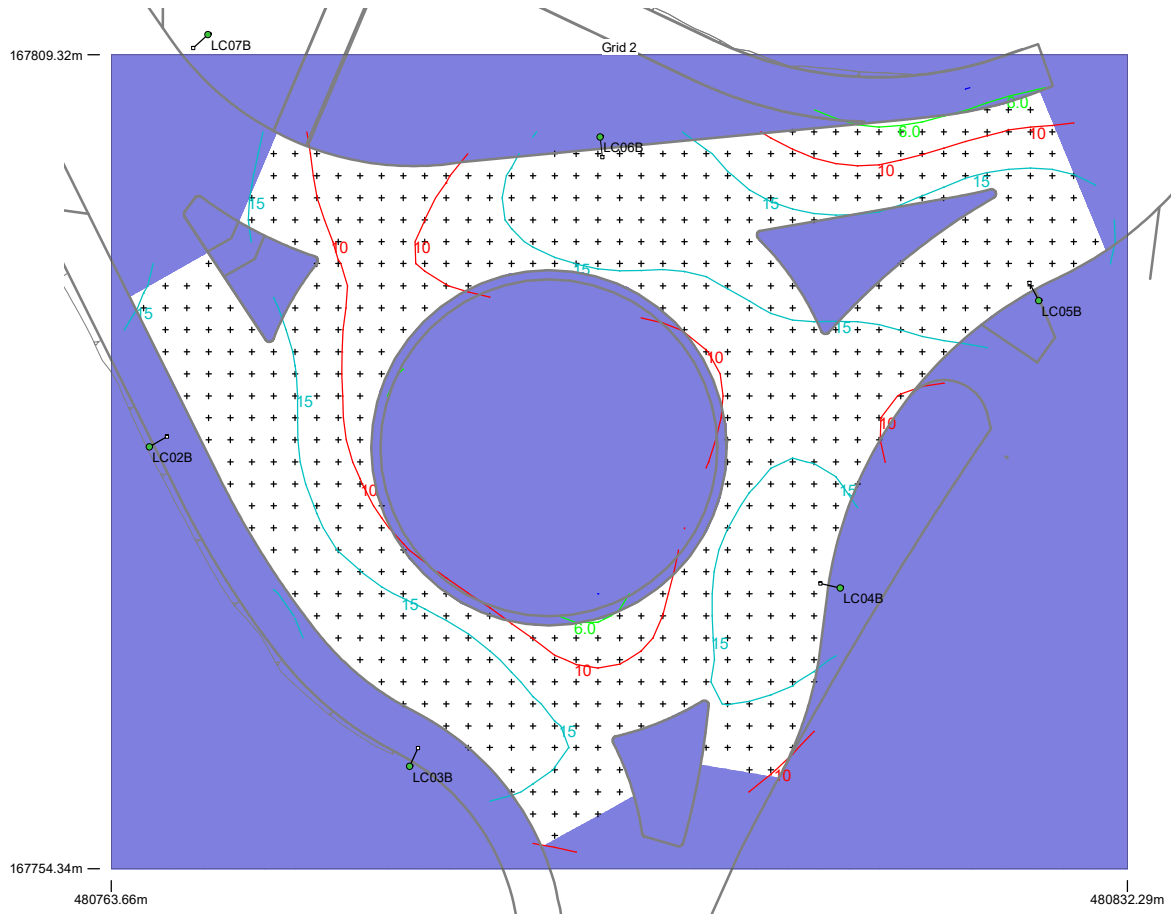
Grid 3

**Results**

Eav	10.12
Emin	4.84
E _{max}	22.53
Emin/E _{max}	0.21
Emin/Eav	0.48

Horizontal Illuminance (lux)

Grid 2

**Results**

Eav	15.05
Emin	6.36
Emax	26.91
Emin/Emax	0.24
Emin/Eav	0.42

DATE: 16 July 2024

DESIGNER: Jennifer Barclay

PROJECT No: WMHP-TG-WG2-CA-LI-1301

PROJECT NAME: WMHP - SWDR WG2 - Lighting Calculations with Dimming

**LIGHTING
REALITY**

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Design Software from:
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Luminaires



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Lamp Flux (klm)	13.00
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Maintenance Factor	0.74
Imax70,80,90(cd/klm)	523.4, 90.0, 0.0
No. in Project	2



Luminaire B Data

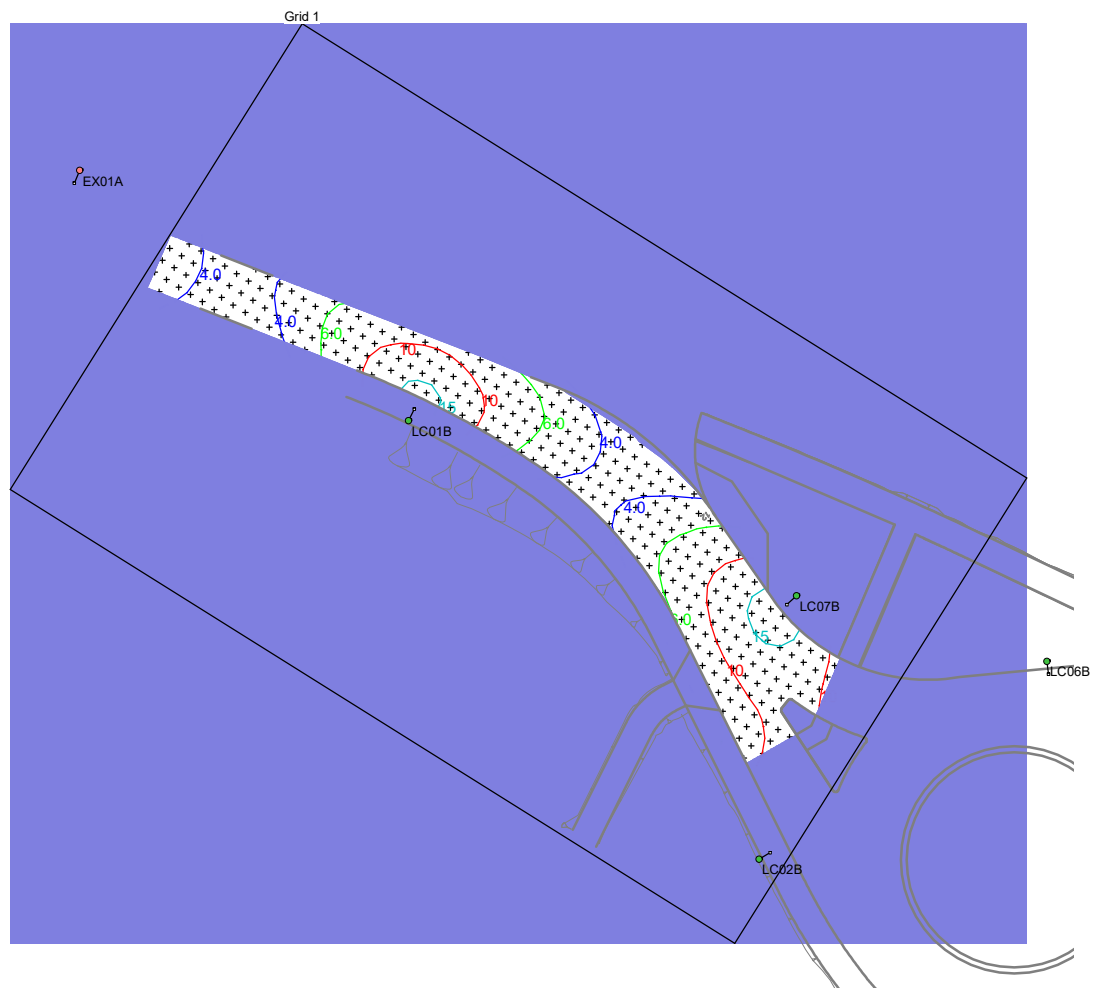
Supplier	Philips
Type	BGP621_DM11_12000_40LED_5.1S_CLO_L90_NW
Lamp(s)	LED-HB 5.1S NW
Lamp Flux (klm)	12.00
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No. in Project	7

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ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Dimmed to	Target X	Target Y	Target Z
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LC05	B	480826.28	167792.69	10.00	117.00	0.00	0.00	1.36	65%			
LC03	B	480783.80	167761.27	10.00	65.00	0.00	0.00	1.36	70%			
LC04	B	480812.87	167773.30	10.00	167.00	0.00	0.00	1.36	70%			
EX02	A	480796.17	167727.50	10.00	152.00	0.00	0.00	1.50	80%			
LC02	B	480766.24	167782.85	10.00	30.00	0.00	0.00	1.36	65%			
LC01	B	480729.22	167829.18	10.00	64.00	0.00	0.00	1.36	65%			
LC07	B	480770.19	167810.69	10.00	223.00	0.00	0.00	1.36	65%			

Horizontal Illuminance (lux)

Grid 1

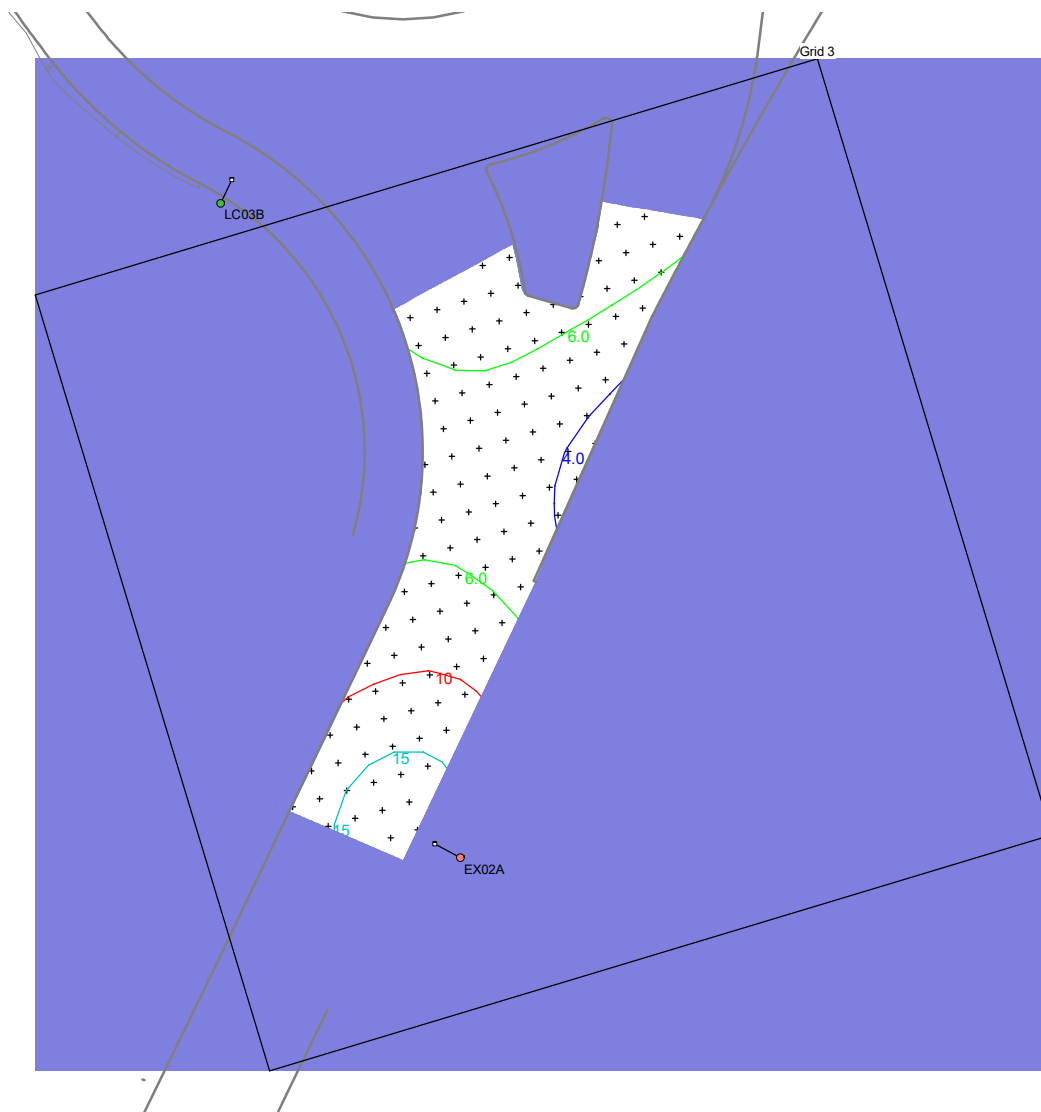


Results

Eav	7.66
Emin	3.19
Emax	17.37
Emin/Emax	0.18
Emin/Eav	0.42

Horizontal Illuminance (lux)

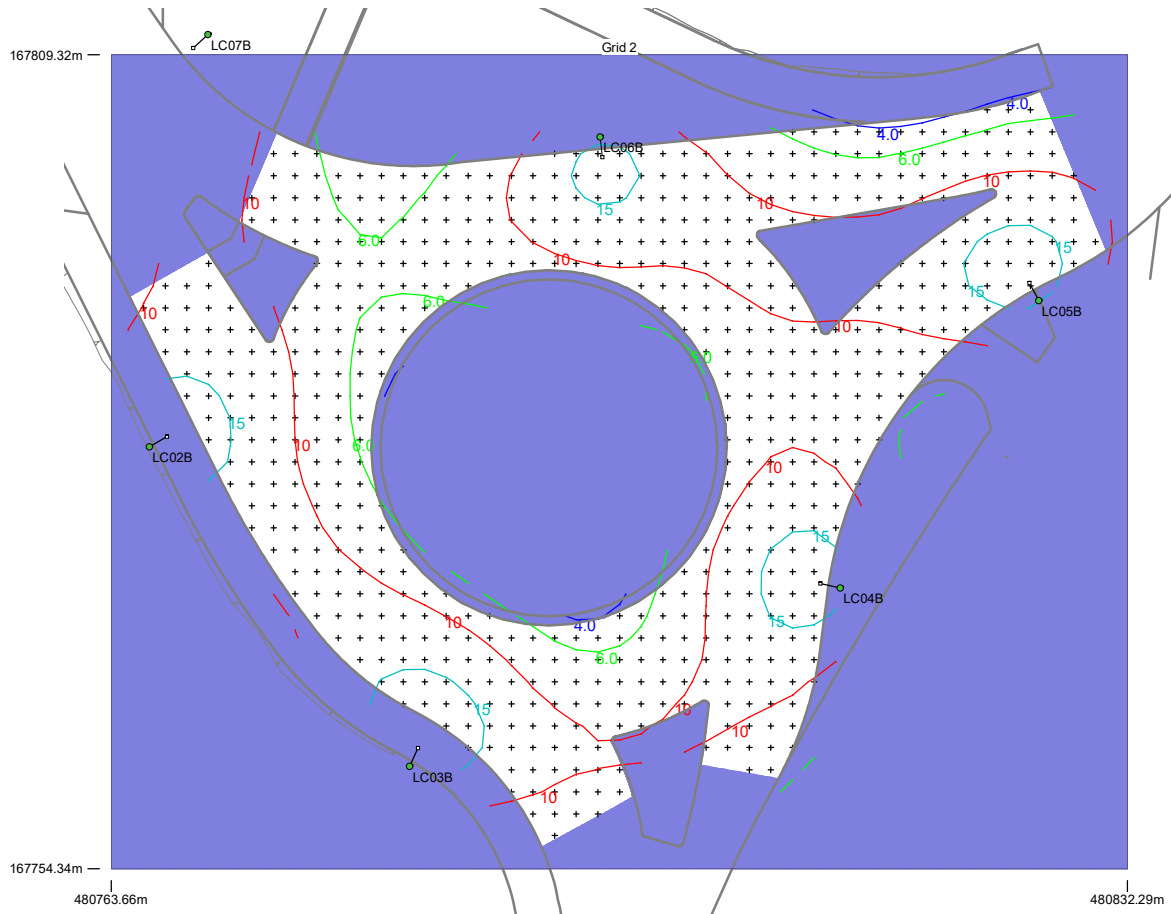
Grid 3

**Results**

Eav	7.81
Emin	3.59
Emax	18.01
Emin/Emax	0.20
Emin/Eav	0.46

Horizontal Illuminance (lux)

Grid 2



Results

Eav	10.09
Emin	4.19
Emax	18.15
Emin/Emax	0.23
Emin/Eav	0.42